



# ADDENDUM

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## **System Impact Assessment Addendum - Underwood Wind Generating Station (WGS) Connection Assessment & Approval Process**

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**Issue 2.0**

**CAA ID 2004-143**

*Applicant:* Enbridge Ontario Wind Power LP

Market Facilitation Department

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<b>Document Name</b>	System Impact Assessment Addendum
<b>Issue</b>	Issue 2.0
<b>Reason for Issue</b>	Addendum to SIA report dated December 5, 2006
<b>Effective Date</b>	February 12, 2010

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The System Impact Assessment (SIA) report dated December 5, 2006 had been conducted to examine the effect of the 199.65 MW Underwood wind farm on the reliability of the IESO-controlled grid. The SIA report indicated that the Underwood WGS must connect to and participate in the Bruce Special Protection System (BSPS). This addendum reviews the options available to Enbridge for their Underwood WGS to meet its obligations to participate in the BSPS.

The BSPS is a collection of special protection systems installed at the Bruce B switching station (SS) and at other stations, which perform pre-defined control actions in response to recognized contingencies by monitoring the status of the electrical connection between nodes in southern Ontario. The primary purpose of the BSPS is to allow increased pre-contingency transfers on the existing transmission facilities emanating from the Bruce nuclear generation station (NGS).

The BSPS is classified as a “Type 1 Special Protection System”, and conforms to criteria and guidelines specified in the Northeast Power Coordinating Council (NPCC) Special Protection System Criteria Document A-11.

The IESO has identified a requirement that wind generation stations connecting near the Bruce NGS must connect to and participate in the BSPS. As detailed in the SIA report and addendum for Hydro One BSPS modifications (CAA ID 2005-EX222), the incorporation of wind generation rejection (G/R) to the BSPS is considered a new BSPS control action. It is expected that this new control action will provide the IESO with increased operating flexibility during transmission outage conditions.

Special protection system facilities must be installed at Underwood to accept a single pair (A & B) of G/R signals from the BSPS, and disconnect from B4V and B5V with no intentional time delay, when selected for pre-arming by the IESO. These special protection system facilities must also comply with the NPCC Criteria Document A-11 for Type 1 special protection systems. Enbridge must provide two dedicated communication channels, separated physically and geographically diverse, between Underwood and the Bruce NGS.

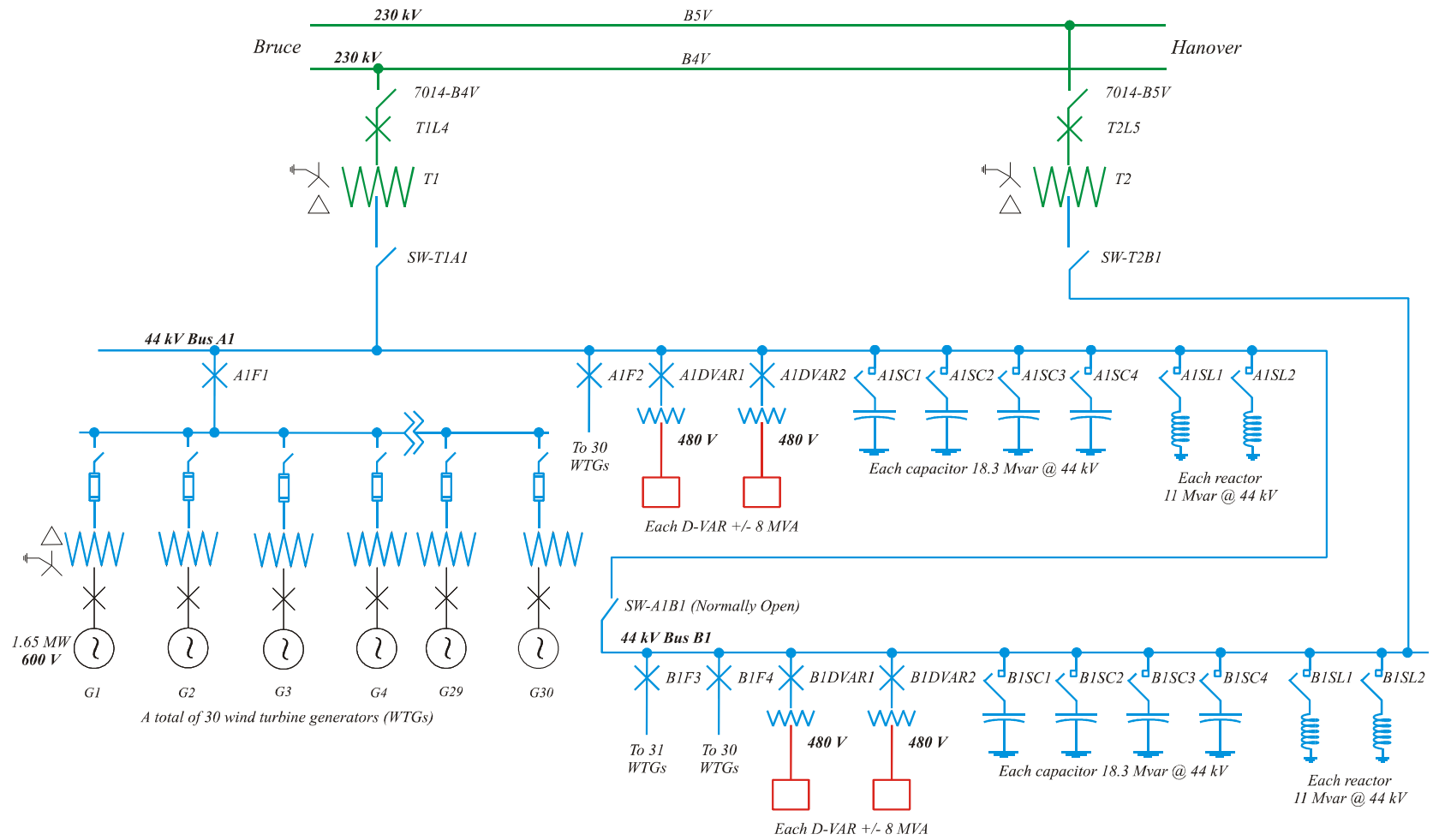
The following actions should be taken to disconnect Underwood facility from B4V and B5V upon receipt of generation rejection signals from the BSPS.

Trip all 44 kV breakers and capacitor/reactor circuit switchers and if any 44 kV breaker/circuit switcher on A1 bus and B1 bus fail to operate, breaker-failure is to initiate tripping of the 230 kV breakers, T1L4 and T2L5, respectively. Further tripping (i.e. of 230 kV breakers on the B4V and B5V circuits at Bruce TS, Orangeville TS and Hanover TS) must not be initiated should any of the 230 kV breakers T1L4 or T2L5 fail to operate.

After being tripped by the BSPS, the closing of the breakers is not permitted until approval is obtained from the IESO.

Enbridge is required to work with Hydro One to design and jointly implement the scheme. It is required that the BSPS changes and the registration of the changes through the Markey Entry process be completed by April 30, 2010.

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**Underwood Wind Generation Station**  
**199.65 MW (B4V - 99 MW/B5V - 100.65 MW)**